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10/808,130	03/24/2004	Cyrus B. Clarke	2003-0848.02	4541

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EXAMINER	
WORKU, NEGUSSIE	
ART UNIT	PAPER NUMBER
2625	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/808,130	CLARKE ET AL.	
	Examiner	Art Unit	
	NEGUSSIE WORKU	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *16-32* is/are allowed.

6)☒ Claim(s) *1-3,8 and 11-15* is/are rejected.

7)☒ Claim(s) *4-7,9 and 10* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/12/06; 12/11/06; 03/24/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This is a replay to the application filed on 03/24/04, in which, claims 1-32 are pending. Claims 1, 16 and 21 are independent, and claim 2-15, 17-20, 22-32 are dependent.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 12/12/06, 12/11/06, 03/24/04, have been reviewed. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the examiner is considering the information disclosure statement.

Objection to Specification

3. The disclosure is objected to because of the following informalities: The serial number of the cross-reference application as indicated in page 1, 6, 10 and 13, related to the current application has to be submitted. Therefore, appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-3, 8, 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Birgmeir (USP 4,757,351), in view of Ishigami et al. (USP 5,933,184).

With respect to claim 1, Birgmeir '351' discloses a method of computing a linearity profile to compensate for scan line velocity nonlinearity in an electro photographic device (a method shown in fig 1-3, a method of and arrangement a reproduction of a colored original) comprising: obtaining a plurality of laser beam position measurements (col.7, lines 3-15);

assigning a first insertion time (col.5, lines 1-7); assigning a second insertion time (scanning time and processing time is assigned or determined by processing unit 2 of fig 1, col.5, lines 1-7); and performing for a plurality of Pel locations along a laser beam scan path (col.8, lines 15-20):

determining an ideal Pel location based upon a desired correction resolution (col.8, lines 44-50); computing a first postulated position based upon said first insertion time and selects ones of said plurality of measurements (col.9, lines 30-40);

computing a second postulated position based upon said second insertion time and selects ones of said plurality of measurements (col.9, lines 35-40); and storing a correction value corresponding to a select one of said first and second postulated positions that is closest to said ideal Pel location (col.10, lines 1-20, and col.8, lines 50-58).

Although Birgmeir '351' teaches controlling the timing of the scanning and processing the image as indicated above. However, Birgmeir dose not teach first and second insertion timing.

Ishigami et al. in the same area of color image forming device teaches first and second insertion timing is controlled by clock generator 45 of fig 6, col.12, lines 20-25).

Therefore, it would have been obvious to a person with ordinary skill in the art at the time the invention was made to have modified imaging device of Birgmeir '351' by the teaching of Ishigami et al., it should be clear to one skilled in the art that anyone of a wide variety of image forming devices can be similarly employed to accomplish this desired result without depending from the teaching of the present invention, for the purpose of obtaining a perfect final image, for all the prints of different color to be exactly superimpose.

With respect to claim 2, Birgmeir '351' discloses the method of computing a linearity profile to compensate for scan line velocity nonlinearity in an electro photographic device (the method shown in fig 1-3), wherein said plurality of laser beam position measurements comprise a plurality of test points that measure for each test point, a scan direction position and a corresponding time value (scanning time and processing time is assigned or determined by processing unit 2 of fig 1, col.5, lines 1-7).

With respect to claim 3, Birgmeir '351' discloses the method of computing a linearity profile to compensate for scan line velocity nonlinearity in an electro

photographic device (the method shown in fig 1-3), wherein each corresponding time value is expressed as a function of an angle of a rotating polygonal mirror in a corresponding print head, (scanning time and processing time is assigned or determined by processing unit 2 of fig 1, col.5, lines 1-7).

With respect to claim 8, Birgmeir '351' discloses the method of computing a linearity profile to compensate for scan line velocity nonlinearity in an electro photographic device (the method shown in fig 1-3), wherein said plurality of laser beam position measurements is modified based upon registration data (col.7, lines 3-20).

With respect to claim 11, Birgmeir '351' discloses the method of computing a linearity profile to compensate for scan line velocity nonlinearity in an electro photographic device (the method shown in fig 1-3, 11, wherein said ideal Pel location is based upon previously accumulated ideal Pel location position (col.8, lines 15-20).

With respect to claim 12, Birgmeir '351' discloses the method of computing a linearity profile to compensate for scan line velocity nonlinearity in an electro photographic device (the method shown in fig 1-3, wherein said ideal Pel location is based upon an initial ideal Pel location corresponding to a location of a first written Pel associated with a printed page (col.9, lines 35-40).

With respect to claim 13, Birgmeir '351' discloses the method of computing a linearity profile to compensate for scan line velocity nonlinearity in an electro photographic device (the method shown in fig 1-3),

Although Birgmeir '351' teaches controlling the timing of the scanning and processing the image as indicated above. However, Birgmeir dose not teach first and second insertion timing.

Ishigami et al. in the same area of color image forming device teaches first and second insertion timing is controlled by clock generator 45 of fig 6, col.12, lines 20-25).

Therefore, it would have been obvious to a person with ordinary skill in the art at the time the invention was made to have modified imaging device of Birgmeir '351' by the teaching of Ishigami et al., it should be clear to one skilled in the art that anyone of a wide variety of image forming devices can be similarly employed to accomplish this desired result without depending from the teaching of the present invention, for the purpose of obtaining a perfect final image, for all the prints of different color to be exactly superimpose.

With respect to claim 14, Birgmeir '351' discloses the method of computing a linearity profile to compensate for scan line velocity nonlinearity in an electro photographic device (the method shown in fig 1-3).

Although Birgmeir '351' teaches controlling the timing of the scanning and processing the image as indicated above. However, Birgmeir dose not teach first and second insertion timing.

Ishigami et al. in the same area of color image forming device teaches first and second insertion timing is controlled by clock generator 45 of fig 6, col.12, lines 20-25).

Therefore, it would have been obvious to a person with ordinary skill in the art at the time the invention was made to have modified imaging device of Birgmeir '351' by the teaching of Ishigami et al., it should be clear to one skilled in the art that anyone of a wide variety of image forming devices can be similarly employed to accomplish this desired result without depending from the teaching of the present invention, for the purpose of obtaining a perfect final image, for all the prints of different color to be exactly superimpose.

With respect to claim 15, Birgmeir '351' discloses the method of computing a linearity profile to compensate for scan line velocity nonlinearity in an electro photographic device (the method shown in fig 1-3), wherein a print resolution is different from said desired correction resolution, and said linearity profile is scaled to said print resolution (col.10, lines 10-20).

Allowable Subject Matter

6. Claims 16-32 are allowed.

Claims 16-20 are allowed for the reason the prior art searched and of record neither anticipates nor suggests obtaining a plurality of laser beam position

measurement comprising a plurality of test points that measure for each test point, a scan direction position and a corresponding time value; initializing an accumulated angle; computing an initial scan direction position based upon said starting accumulated angle; assigning a first insertion time; assigning a second insertion time; and performing for a plurality of Pel locations along a laser beam scan path: determining an ideal scan direction Pel location based upon a predetermined correction resolution; computing a first postulated angle based upon said first insertion time and said accumulated angle; converting said first postulated angle to a first postulated position based upon select ones of said plurality of measurements; computing a second postulated angle based upon said second insertion time and said accumulated angle; converting said second postulated angle to a second postulated position based upon select ones of said plurality of measurements; comparing said ideal scan direction Pel location to said first and second postulated positions; storing a correction value corresponding to a select one of said first and second postulated positions that is minimizes an error computation relative to said ideal scan direction Pel location; and updating said accumulated angle to said first postulated angle if said first postulated position results in less error than said second postulated position, and updating said accumulated angle to said second postulated angle if said second postulated position results in less error than said first postulated position.

Claims 21-32 are allowed for the reason the prior art searched and of record neither anticipates nor suggests a laser beam scan line velocity linearity registration system comprising: a slice clock operatively configured to output slice clock pulses

having a fixed frequency; a pel clock generator programmably configured to generate pel clock pulses based upon said slice clock pulses and correction values input thereto; a pel clock counter communicably coupled to said pel clock generator, said pel clock counter operatively configured to determine a count value corresponding to a count of pel clock pulses; a linearity table having stored therein, a plurality of correction values, said linearity table communicably coupled to said pel clock counter and said pel clock generator such that an associated one of said correction values is selected from said linearity table based upon said count value from said pel clock counter and is communicated to said pel clock generator, wherein a duration of a corresponding pel clock pulse is determined from said correction value; and a video unit arranged to communicate Pels to a corresponding laser beam, said video unit coupled to said slice clock and said pel clock, wherein a duration of each Pel is determined by said slice clock, and spacing between Pels is determined by said pel clock.

Claims objected to having Allowable Subject Matter

7. Claims 4-7, 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 4-7 are objected to for the reason the prior art searched and of record neither anticipates nor suggests the method wherein said first postulated position is computed based upon a rotational velocity of said rotating polygonal mirror and said first insertion time to derive a first postulated angle; said second postulated position is

computed based upon said rotational velocity of said rotating polygonal mirror and said second insertion time to derive a second postulated angle; and for each of said first and second postulated angles: identifying an upper bound as a select one of said plurality of test points having an angle greater than said corresponding first or second postulated angle; identifying a lower bound as a select one of said plurality of test points having an angle less than said first or second postulated angle; and interpolating said corresponding first or second postulated position based upon said associated upper and lower bounds.

Claims 9 is objected to for the reason the prior art searched and of record neither anticipates nor suggests the method, wherein said registration data comprises a margin adjustment, said margin adjustment computed by rotating said laser beam position measurements such that each scan direction measurement is modified and corresponding ones of said angle measurements are unchanged.

Claims 10 is objected to for the reason the prior art searched and of record neither anticipates nor suggests the method, wherein a select one of said first and second postulated positions is chosen as being closest to said ideal Pel location by: computing an absolute error of said first postulated position relative to said ideal Pel location, computing an absolute error of said second postulated position relative to said ideal Pel location, and choosing a select one of said first and second postulated positions with the smallest absolute error.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NEGUSSIE WORKU whose telephone number is (571)272-7472. The examiner can normally be reached on 9A-6PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Coles can be reached on 571-272-7402. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Negussie Worku/
Examiner, Art Unit 2625